

IN THE CLAIMS:

1. (currently amended) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a first metal barrier overlying the gate insulator, having a thickness of less than 5 nanometers (nm);

forming a second metal gate electrode overlying the first metal barrier with a work function exclusively responsive to the second metal; and

wherein the second metal is a material selected from a group including n+ poly, W, Re, RuO₂, Pt, Ti, Hf, Zr, Cu, V, Ir, Ni, Mn, Co, NbO, Pd, Mo, TaSiN, and Nb.

2. (previously presented) The method of claim 1 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a thickness of greater than about 10 nm.

3. (original) The method of claim 2 wherein forming a first metal barrier includes forming a first metal barrier having a thickness of greater than 1.5 nm, and less than 5 nm.

4. canceled

5. (original) The method of claim 1 wherein forming a gate insulator overlying a channel region includes forming a gate insulator from a material selected from the group including SiO₂, high-k dielectrics

such as HfO₂, ZrO₂, Al₂O₃, La₂O₃, HfAlO_x, and HfAlON, and binary, ternary, and nitrided metal oxides.

6. (original) The method of claim 1 wherein forming a first metal barrier includes forming the first metal barrier from a material selected from the group including binary metals such as TaN, TiN, and WN.

7. (original) The method of claim 6 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a high work function.

8. (currently amended) The method of claim 7 wherein forming a second metal gate electrode with a high work function includes the second metal being selected from the group including ~~elemental metals such as Ir, Pt, Cu, Re, Ni, Mn, Co, RuO₂, p+ poly, Pd, Mo, and TaSiN, and binary metals such as TaN, WN, and TiN.~~

9. (original) The method of claim 6 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a low work function.

10. (currently amended) The method of claim 9 wherein forming a second metal gate electrode with a low work function includes selecting the second metal from the group including ~~of materials including elementary metals such as Al, Nb, Hf, Zr, V, Ir, n+ poly, W, Ti, [[Ta,]] and NbO, and binary metals such as TaN, TiN, and WN.~~

11. (original) The method of claim 1 wherein establishing a gate work function exclusively responsive to the second metal includes establishing a threshold voltage (V_{th}).

12. (original) The method of claim 1 wherein forming a first barrier metal overlying the gate insulator includes the first metal barrier preventing the migration of oxygen from the gate insulator to the second metal gate electrode.

13. (original) The method of claim 1 wherein forming a first barrier metal overlying the gate insulator includes the first metal barrier preventing the migration of B into the gate insulator from a p+ poly gate electrode.

14-26. canceled

27. (currently amended) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a first metal barrier overlying the gate insulator;

forming a second metal gate electrode overlying the first metal barrier, ~~selected from the group of materials including elemental metals such as Ir, Pt, Re, Ni, Mn, Co, RuO₂, p+ poly, Pd, Mo, and TaSiN, and binary metals such as TaN, WN, and TiN; [[and,]]~~

wherein the gate electrode has a high work function exclusively responsive to the second metal being selected from a group consisting of Ir, Pt, Re, Ni, Mn, Co, RuO₂, p+ poly, Pd, Mo, and TaSiN; and

wherein the gate electrode has a low work function exclusively responsive to the second metal being selected from the group consisting of Al, Nb, Hf, Zr, V, Ir, n+ poly, W, Ti, and NbO.

28. canceled

29. (new) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a WN metal barrier overlying the gate insulator, having a thickness of less than 5 nanometers (nm); and,

forming a second metal gate electrode overlying the WN metal barrier with a work function exclusively responsive to the second metal.